

## REMARKS

### I. Status of the Claims

Claims 1-12 are pending. Applicants cancel claims 1-12 and present new claims 13-17 in this response. Support for the new claims appears in the application in Examples 7.2 and 8.2 (see structures); p. 11, l. 25 through p. 12, l. 18 (description of "A" group); and original claim 2 (M=Cr, Mo, W; X = halogen). Upon entry of the amendment, claims 13-17 will remain for consideration.

### II. Supplemental Information Disclosure Statement

Applicants submit with this response a list of references, and they respectfully ask the Examiner to consider them. U.S. Pat. No. 7,238,818 (equivalent to U.S. Pat. Appl. Publ. No. 2005/0192418) describes complexes in which a cyclopentadienyl ligand is fused to a heterocycle. U.S. Pat. No. 6,723,675 (equivalent to WO 01/92346) describes chromium complexes in which a cyclopentadienyl or indenyl ligand is bridged via a one-carbon bridge to a pyridinyl moiety. A. Döhring et al., Organometallics **19** (2000) 392 discloses cyclopentadienyl chromium complexes in which the Cp group is ethylene-bridged to an N-pyrrolidinyl group (a non-aromatic heterocycle) and has a disclosure similar to that of already-considered U.S. Pat. No. 6,255,418.

### III. Response to the Section 112 Rejection

Claims 1-6 stand rejected under 35 U.S.C. § 112, second paragraph, as indefinite. Applicants have overcome the rejection by cancelling claim 1. In view of the amendment, the Examiner should reconsider and withdraw the rejection.

### IV. Objection to the Specification

The Examiner objected to the specification because of a nomenclature error. Applicants have corrected the error, so the Examiner should withdraw the objection.

V. Response to the Rejection under Section 103(a)

Applicants traverse the rejection of claims 1-6 under 35 U.S.C. § 103(a) as unpatentable over U.S. Pat. Appl. Publ. No. 2001/0041777 (Meyer et al.), and they respectfully ask the Examiner to reconsider and withdraw the rejection in view of the following remarks.

Meyer teaches supported heterometallocene catalysts wherein the support is a particulate polymeric material (Abstract). The transition metal complex and a boron activator compound are deposited on the support (Abstract). The Examiner noted that suitable complexes are broadly described as having formula  $(L^*)_n(L)_mM(X)_y$  where  $L^*$  is an anionic polymerization-stable heteroatomic ligand, L could be indenyl, M could be Cr, and the  $L^*$  and L ligands could be bridged by an ethylene moiety. Meyer describes particularly advantageous  $L^*$  groups as "substituted and unsubstituted boraaryl, pyrrolyl, azaboroliny, quinoliny, and pyridiny ligands" (paragraph [0015]). In the only examples, Meyer uses a particular non-bridged cyclopentadienyl boraarylzirconium complex (see paragraphs [0042] through [0047]).

Applicants have cancelled claims 1-6, so the issue is whether the new claims are patentable over Meyer and other teachings in the art. Applicants' claims define Group 6 metal indenyl complexes that incorporate a substituted, unsubstituted, or benzo-fused oxazolyl, thiazolyl, or imidazolyl group. The heterocyclic moiety is bridged to the indenyl group via a gem-dimethyl substituted two-carbon bridge (see new claim 13).

Meyer fails to fairly teach or suggest the now-claimed complexes. In particular, Meyer teaches Group 6 complexes only in the most general sense, as a subclass of Group 3-10 metals; the only examples are with a single zirconium (Group 4) complex. Meyer discloses ethylene bridging, but not the particularly claimed dimethyl-substituted ethylene bridge; moreover, the only example shown by in the reference is an unbridged complex. Finally, Meyer does not disclose the particularly claimed "A" groups: the oxazolyl, thiazolyl, or imidazolyl moieties. The new claims exclude the pyridiny group expressly taught by Meyer and other related art such as U.S. Pat. No. 6,723,675.

As additional evidence that the now-claimed complexes are distinguishable over Meyer and other references suggesting a cyclopentadienyl or indenyl group bridged to a pyridinyl moiety, consider Applicants' Table 2 results. There, Applicants show that an imidazolyl complex (Ex. 8) incorporates comonomers well (density reduced from 0.965 g/cm<sup>3</sup> for the homopolymer to 0.909 g/cm<sup>3</sup> for LLDPE) without a significant decrease in molecular weight (Mw remains close to 50,000). Good comonomer incorporation is also demonstrated for the thiazolyl complex (Ex. 7), which gave 12 branches per 1000 carbons. These advantages of the claimed complexes are neither taught nor suggested by Meyer or other related art. In sum, Applicants' claimed complexes meet the patentability requirements of Section 103.

#### VI. Conclusion

In view of the remarks above, Applicants respectfully ask the Examiner to enter the amendments, reconsider and withdraw the rejections, and pass the case to issue. Applicants invite the Examiner to telephone their attorney at (610) 359-2276 if she believes that a discussion of the application might be helpful.

---

I hereby certify that this correspondence is being deposited with the United States Postal Service as first-class mail, with sufficient postage, in an envelope addressed to: Commissioner for Patents, P.O. Box. 1450, Alexandria, VA 22313-1450 on June 27, 2008.

Jonathan L. Schuchardt  
Name of person signing

Jonathan L. Schuchardt  
Signature

---

Respectfully submitted,  
Shahram Mihan et al.

By: Jonathan L. Schuchardt  
Jonathan L. Schuchardt  
Reg. No. 34,428  
Attorney for Applicant(s)  
LyondellBasell Industries  
3801 West Chester Pike  
Newtown Square, PA 19073  
Phone (610) 359-2276  
Customer Number 24114  
June 27, 2008